

Notice of Allowability

Application No.

10/014,522

Examiner

Tran N. Nguyen

Applicant(s)

AKIWA, NAOTAKA

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/12/03.
2. ☒ The allowed claim(s) is/are 1-9 and 11-20.
3. ☒ The drawings filed on 14 December 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____ |
| 5 <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____ | 6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other _____ |

DETAILED ACTION

Election/Restriction

Applicant's election, without traverse, of claims 1-9 and 11-20 on 6/12/03 is acknowledged. The election/restriction is made FINAL.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Examiner's Amendment

An Examiner's Amendment to the record appears below. Should the changes and/or additions be unacceptable to applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it must be submitted no later than the payment of the Issue Fee.

Please change the following:

In the claim:

In claim 1, line 7, change "to satisfy the"

to —, and a relationship between a predetermined number of the stator magnetic poles and a predetermined number of the rotor magnet poles is established in accordance to a—

In claim 1, line 10, delete "rotatably"

In claim 1, line 15, change "and the"

to —wherein said relationship of the predetermined numbers of stator poles and rotor poles enables--

Art Unit: 2834

In claim 4, line 1, after “the” to –an—

In claim 4, line 2, after “side end” add “of a bearing holder”

In claim 7, line 4, change “which” to –said polygon mirror—

In claim 7, line 4, after “shaft” add “and wherein”

In claim 8, line 12, change “to satisfy the”

**to –, and a relationship between a predetermined number of
the stator magnetic poles and a predetermined number of the
rotor magnet poles is established in accordance to a—**

In claim 8, line 15, delete “rotatably”

In claim 8, line 20, change “the”

**to –wherein said relationship of the predetermined numbers of
stator poles and rotor poles enables--**

In claim 9, line 8, change “to satisfy the”

**to –, and a relationship between a predetermined number of the
stator magnetic poles and a predetermined number of the rotor
magnet poles is established in accordance to a—**

In claim 9, line 11, delete “rotatably”

In claim 9, line 16, change “the”

**to –wherein said relationship of the predetermined numbers of
stator poles and rotor poles enables--**

Cancel claim 10 (which is a non-elected invention. See Election for the restriction).

In claim 11, line 1, change “the” to --an--

Art Unit: 2834

In claim 11, line 2, after “side end” add “of the bearing holder”

In claim 12, line 2, after “side end” add “of the bearing holder”

In claim 20, line 3, change “which” to —said polygon mirror—

In claim 20, line 4, after “shaft” add “and wherein”

Examiner’s Note: The Examiner’s amendment is for clarification of the claimed language, as explained below:

In claims 1, and 8-9, “the rotor is cylindrical in shape with the stator rotatably disposed inside” the term “rotatably” should be deleted because the stator is (stationary) disposed inside the rotor not rotatably disposed therein. Therefore, the amendment clarifies this matter.

In claims 1 and 8-9, “the surface magnetic flux distribution thereto has a substantially sinusoidal wave form circumferentially” is unclear. According to the spec (page 17) the relationship between the numbers of rotor poles and stator poles enables such magnetic flux waveform. Therefore, the amendment clarifies this matter.

In claims 4 and 11-12, “the arc-shaped deformation preventing groove is provided along the circumference at the side end contacting the base” should be changed by adding the end side of the bearing holder. Therefore, the amendment clarifies this matter.

Should the changes and/or additions be unacceptable to applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it must be submitted no later than the payment of the Issue Fee.

Allowable Subject Matter

Claims 1-9 and 11-20 are allowed.

Reason for Allowability

The following is an examiner's statement of reasons for allowance: the primary reason for the allowance is the including, in combination with other limitations recited in the claims, the limitations of a stepping motor comprising:

a permanent magnet type rotor with a plurality of poles secured to a rotating shaft and

a stator having stator magnetic poles with stator magnetic pole teeth in which excitation windings are wound on a plurality of magnetic poles in a star or delta connection, wherein

the rotor is magnetized in different directions alternately circumferentially, **and a relationship between a predetermined number of the stator poles and a predetermined number of the rotor magnet poles is established in accordance to a following equation: $M = 4F / 3$ where M is the number of poles of the rotor and F is the number of the stator magnetic poles,**

the rotor is cylindrical in shape with the stator rotatably disposed inside, disposed opposing the surfaces of the stator magnetic pole teeth through an air gap which is of a uniform dimension throughout the circumference between the surfaces of the stator magnetic pole teeth of the stator and the rotor,

and, wherein said relationship of the predetermined numbers of stator poles and rotor poles enables surface magnetic flux distribution thereof has a substantially sinusoidal wave form circumferentially.

Comparing to the prior-art of the record, the most relevant refs are: JP-363077363, JP354099910, and US 5030864. Each individual of the refs discloses the number of rotor poles and the number of the stator poles are individually applicable to the present invention's selected numbers of rotor poles and stator poles. However, the ref

Art Unit: 2834

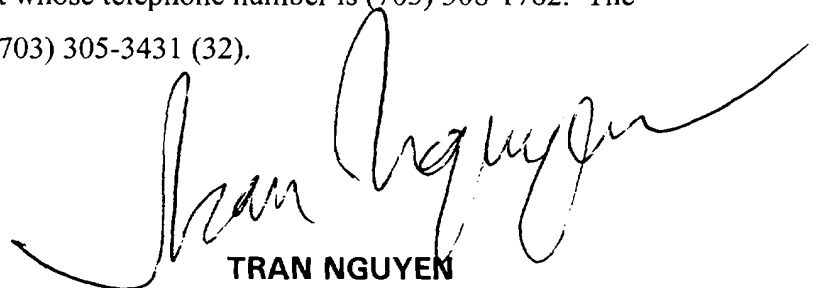
either stand-alone or in combination, do not disclose or suggest the **relationship between a number of the stator poles and a number of the rotor magnet poles is predetermined to satisfy the following equation: $M = 4F / 3$ where M is the number of poles of the rotor and F is the number of the stator magnetic poles.**

Thus, none of the prior art references of the record, either stand-alone or in combination, has taught or suggest the above-mentioned features in combination with other limitations recited in the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran Nguyen whose telephone number is (703) 308-1639.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-1782. The fax phone number for this Group is (703) 305-3431 (32).

A handwritten signature in black ink, appearing to read 'Tran Nguyen', is written over the printed name.

TRAN NGUYEN

PRIMARY PATENT EXAMINER

TC-2800